

WHAT IS CLAIMED IS:

1. A method for making a polyaspartic ester mixture in-situ comprising the sequential steps of:
 - 5 (a) reacting a cyclic amine with an excess amount of an ester of fumaric or maleic acid to form a mixture containing a first polyaspartic ester component and excess unreacted ester of fumaric or maleic acid, and
 - 10 (b) adding an acyclic amine to the mixture resulting from step (a) in an amount sufficient to react the acyclic amine with the excess ester of fumaric or maleic acid and to form a second polyaspartic ester component.
2. The method of Claim 1, wherein the cyclic amine comprises a component selected from the group consisting of 1-amino-3,3,5-trimethyl-5-aminomethylcyclohexane, hexahydro-2,4- diaminotoluene,
15 hexahydro-2,6-diaminotoluene, alkyl substituted cyclohexanediamines 2,4'- and/or 4,4'-diamino-dicyclo-hexylmethane, 3,3'-dimethyl-4,4'-diaminodicyclohexyl-methane, isomers of diaminodicyclohexylmethane having a methyl group as a substituent, and 3,4-aminomethyl-1-methylcyclohexylamine.
- 20 3. The method of Claim 1, wherein the acyclic amine comprises a component selected from the group consisting of ethylene diamine, 1,2-diaminopropane, 1,4-diaminobutane, 1,6-diaminohexane, 2-methyl-1,5-diaminopentane, 2,5-diamino-2,5-dimethylhexane, 2,2,4-trimethyl-1,6-diaminohexane, 2,4,4-trimethyl-1,6-diaminohexane, 1,11-diaminounde-
25 cane, and 1,1,2-diaminododecane.
4. The method of Claim 1, wherein the ester of fumaric or maleic acid comprises an ester selected from the group consisting of diethyl maleate, dipropyl maleate, dibutyl maleate, methyl propyl maleate, ethyl propyl maleate, diethyl fumurate, dipropyl fumurate, dibutyl fumurate,
30 methyl propyl fumurate, and ethyl propyl fumurate.
5. The method of Claim 1, wherein the number ratio of the cyclic amine to the ester of fumaric or maleic acid is at least 2:1.

6. The method of Claim 1, wherein the number ratio of the cyclic amine to the ester of fumaric or maleic acid is from about 20:1 to about 2:1.

7. The method of Claim 1, wherein a conversion of about 100% of the first and second polyaspartic ester components is obtained in less than 20 days.

8. The method of Claim 1, wherein a conversion of about 100% of the first and second polyaspartic ester components is obtained in less than 8 days.

9. A method for making a polyaspartic ester mixture in-situ comprising the sequential steps of:

(a) reacting a cyclic amine with an ester of fumaric or maleic acid to form a mixture containing a first polyaspartic ester component and excess unreacted ester of fumaric or maleic acid, wherein the number ratio of the cyclic amine to the ester of fumaric or maleic acid is at least 2:1 and

(b) adding an acyclic amine to the mixture resulting from step (a) and reacting the acyclic amine with the excess ester of fumaric or maleic acid to form a second polyaspartic ester component, wherein a conversion of about 100% of the first and second polyaspartic ester components is obtained in less than 20 days.

10. The method of Claim 9, wherein the cyclic amine comprises a component selected from the group consisting of 1-amino-3,3,5-trimethyl-5-aminomethylcyclohexane, hexahydro-2,4-diaminotoluene, hexahydro-2,6-diaminotoluene, alkyl substituted cyclohexanediamines 2,4'- and/or 4,4'-diamino-dicyclo-hexylmethane, 3,3'-dimethyl-4,4'-diaminodicyclohexyl-methane, isomers of diaminodicyclohexylmethane having a methyl group as a substituent, and 3,4-aminomethyl-1-methylcyclohexylamine.

11. The method of Claim 9, wherein the acyclic amine comprises a component selected from the group consisting of ethylene diamine, 1,2-diaminopropane, 1,4-diaminobutane, 1,6-diaminohexane, 2-methyl-1,5-diaminopentane, 2,5-diamino-2,5-dimethylhexane, 2,2,4-trimethyl-1,6-

diaminohexane, 2,4,4-trimethyl-1,6-diaminohexane, 1,11-diaminoundecane, and 1,1,2-diaminododecane.

12. The method of Claim 9, wherein the ester of fumaric or maleic acid comprises an ester selected from the group consisting of symmetrical esters, and asymmetrical esters.

13. The method of Claim 9, wherein the number ratio of the cyclic amine to the ester of fumaric or maleic acid is at least 2:1.

14. The method of Claim 9, wherein the number ratio of the cyclic amine to the ester of fumaric or maleic acid is from about 20:1 to about 2:1.

15. The method of Claim 9, wherein a conversion of about 100% of the first and second polyaspartic ester components is obtained in less than 20 days.

16. The method of Claim 9, wherein a conversion of about 100% of the first and second polyaspartic ester components is obtained in less than 8 days.

17. An in-situ mixture of polyaspartic ester esters formed during the method of Claim 9, prior to termination of the process, comprising the first polyaspartic ester component and the second polyaspartic ester component.

18. An in-situ mixture of polyaspartic ester esters formed during the method of Claim 17, prior to termination of the process, comprising the first polyaspartic ester component and the second polyaspartic ester component.